Impact Factors, Post-Publication Peer Review and Other Metrics

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Richard P. Grant, "Impact Factors, Post-Publication Peer Review and Other Metrics" (2009). *Proceedings of the Charleston Library Conference.*
http://dx.doi.org/10.5703/1288284314757

IMPACT FACTORS, POST-PUBLICATION PEER REVIEW AND OTHER METRICS

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Abstract.

The ISI Impact Factor (IF) is the de facto standard for assessing the 'quality' and importance of published research. However, although it is not an unreasonable indicator of the overall quality of any particular journal, its wider applicability is a matter for serious debate. IF is slow, reflecting the field two to three years after the research upon which it is based. It depends on accurate and relevant citation within subsequent papers. It can be unduly skewed by review articles. That a paper is published in a high impact journal is no guarantee of the quality of that research; conversely, good and important research gets published in low impact journals. Furthermore, IF does not capture research that is used in communities where there is no tradition of subsequent citation; for example in Nursing. This has interesting implications for subscription renewals in the current economic climate.

To address deficiencies in IF and provide a more balanced assessment of research output, other indicators are being developed. Individual article-level metrics and network analyses can show how individual papers are being used without reference to citations, and perhaps better reflect the importance of individual quanta of research. Comments on publisher sites are a direct measure of assessment by the community, and selected 'post-publication peer review' is a natural extension of this. We discuss these metrics and how they might complement each other, resulting in a more accurate portrayal of the state of the scientific literature.

Although the flaws in the Impact Factor are well known, it is often claimed that there is nothing better, and librarians tend to base their collection and purchasing decisions using just this metric. However, alternative indicators do exist, and are gaining awareness and significance within the wider community. Additionally, we are seeking to integrate the emerging power of social media with automated metrics, and exploring how best to provide relevant, customized and timely material to researchers and information providers alike.

The Journal Impact Factor (IF) is necessarily slow, reflecting the state of any particular research field at least two to three years after the research upon which it is based. It depends on correct and relevant citation within subsequent papers, which depends on authors citing appropriately in addition to accurate data capture. IF is skewed by review articles: journals can 'game' the IF by publishing more review articles, as they tend to get cited more than original research, 'stealing' citations from those original papers. A journal's IF tends to be determined by a small percentage of its total number of publications, which implies that there is no direct correlation between the quality or significance of any given research paper and the IF of the journal in which it appears. The corollary is that the quality of a paper published in a high impact journal is not guaranteed; conversely, good and important research gets published in low impact journals. Furthermore, IF does not capture research that is used in communities where there is no tradition of subsequent citation; for example in Nursing.

More direct measures of quality and usage do exist, and it can be argued that these are more relevant to individual researchers, as well as information providers such as librarians. The problem then becomes one of finding relevant indicators or metrics, and deciding which are most appropriate for a discipline or community.

Some alternative indicators include
Article level metrics (table of pros & cons)/usage data (and the caveats associated with this!)

Network analyses—Johan Bollen

Comments on publishers' sites.

Importance of community assessment of articles. The best arbiters of 'quality'/importance/relevance are likely to be the researchers themselves, so it is important to be able to capture their opinions in a form that is readily understandable (even intuitive) and machine readable (for the purposes of grants, Research Excellence Framework etc. etc.). This information is already available, in one form or another, but can be difficult to summarize or aggregate. For example, there is a thriving life scientist community on FriendFeed where papers can be discussed informally. It's pretty disorganized though.

We discuss these different indicators and how they might complement each other, resulting in a more accurate portrayal of the state of the scientific literature. None are without shortcomings, however, and it would be just as misleading to rely on any single one as it has been to rely on the IF.

Furthermore, since 2002 we have offered 'expert' review of the biological and medical literature: our so-called 'post-publication peer-review'. We are exploring ways to combine the learned opinion on our site with real-life journal clubs and our new f1000 factors so that researchers and supporters of that research can easily and rapidly find where the best science in any particular discipline is being published. Combined with new search mechanisms, mark-up tools and text mining we are also looking at how to bring this information to the people who require it, in easily-managed and digestible form. No longer will scientists and librarians have to search for this information, but it will come to them.